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PATENT SPECIFICATION

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COMPLETE SPECIFICATION

DRAWINGS ATTACHED

Improvements in Vibrators for Compacting Concrete and Like Bulk Materials

WE, HERMANN WACKER AND PETER WACKER, both German Nationals, both of 41 Preussenstrasse, Munich 13, Germany, do hereby declare the invention, for which 5 we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to vibrators 10 of the kind to be inserted in concrete and like bulk materials for compacting the same.

A known electrically-driven vibrator for insertion into a body of material to be compacted has the driving motor and an out- 15 of-balance mass (oscillator) combined together, the out-of-balance mass being divided into two or more bodies and mounted on the downwardly-extended shaft end of the driving motor on both sides of a bearing in such a manner that the bending strain 20 on the shaft is reduced to a minimum. With such a vibrator construction, it is only possible to use out-of-balance masses which are rather small in size and light in weight.

25 Vibrators of the above kind must be of small overall dimensions, as they are often required to pass between closely-spaced reinforcement bars and shuttering. At the same time, they must be capable of developing sufficient energy to compact the concrete completely. 30

An object of this invention is to provide a vibrator which enables larger and heavier rotating out-of-balance masses to be used 35 whilst avoiding substantially the friction and eddy currents which occur during operation of known compacting apparatus, and which can cause considerable loss of power at high operational speeds. Such 40 loss of power thus demands an increase in driving force with consequential enlargement of the overall dimensions of the compacting apparatus.

[Price 4s. 6d.]

The present invention makes it possible to provide vibrators of higher performance 45 than hitherto and with greater rotating masses without the occurrence of unwanted friction and eddy currents.

According to the present invention, a vibrator of the kind referred to for com- 50 pacting concrete and like bulk materials, comprises a casing containing an oscillator of heavy metal, or an alloy of heavy metals, the oscillator being located as an eccentric mass in a circular body rotatably journaled 55 in the casing, which body has a smooth uninterrupted outer surface concentric with the axis about which it rotates for the purpose of avoiding or minimising friction and eddy currents. 60

By the term "heavy metal" or "heavy metals" used herein is meant a metal of high specific gravity, such as tungsten or a metal alloy thereof.

In a preferred embodiment, journals supporting the oscillator are connected by the addition of one or more axially-disposed tie-rods, whereby to increase the bending resistance of the oscillator. 65

Thus, it is possible to select a heavy 70 metal or alloys of heavy metals without any particular regard to their properties of strength, but simply with respect to a high specific gravity and thus maximum centrifugal force. 75

Also in the preferred embodiment of the invention the body housing the oscillator is in the form of a cylinder and the diameters of the journals at their ends which force the cylinder are enlarged to correspond to 80 the inside diameter of the cylinder, said cylinder extending somewhat beyond the ends of the oscillator so as to receive the enlarged journal ends.

The tie-rods may extend through the 85 oscillator to assist in securing it in position.

The invention is further described with reference to the accompanying drawings which illustrate one embodiment by way of example and in which:—

- 5 Fig. 1 is a longitudinal section of a vibrator to be inserted in a body of material to be compacted, and

Fig. 2 is a cross-section taken on the line A-B of Fig. 1.

- 10 Referring to the drawings, a casing 1 of a vibrator contains an oscillator 2 which can be driven in any desired manner, for example, by means of flexible shafts, from an electric motor or petrol engine.

- 15 The oscillator 2 comprises a shaped mass 3 of heavy metal, or an alloy of heavy metals, having end projections 4 which engage in corresponding grooves 3a of two journals 5 and 6. The journals 5 and 6 are interconnected and held against bending by a thin-walled tube or cylinder 7 of high-strength material, which also houses the oscillator 2.

- To increase strength, the journals 5 and 25 6 can also be held in the axial direction by one or more axially disposed tie-rods 8. The journals 5 and 6 serve to maintain the eccentric position of the shaped mass 3 and also for mounting the oscillator in bearings 30 9 and 10. The tie-rods 8 extend through the oscillator 2 to assist in securing it in position. The journals 5 and 6 are, in this preferred embodiment, enlarged at their ends 5' and 6' which face the cylinder 7 35 so as to correspond to the inside diameter thereof. The cylinder 7 surrounds the shaped mass 3 and extends somewhat beyond the ends thereof so as to receive the enlarged ends 5' and 6' of the journals 5 40 and 6. Thus, the journals and the cylinder completely encase the shaped mass 3, with the closed-ended cylinder providing a

smooth, uninterrupted outer surface concentric with the axis about which it rotates, whereby to avoid or minimise friction and 45 eddy currents during operation of the vibrator.

WHAT WE CLAIM IS:—

1. A vibrator of the kind referred to for compacting concrete masses and like bulk 50 materials, which comprises a casing containing an oscillator of heavy metal, or an alloy of heavy metals, the oscillator being located as an eccentric mass in a circular body rotatably journaled in the casing, 55 which body has a smooth uninterrupted outer surface concentric with the axis about which it rotates for the purpose of avoiding or minimising friction and eddy currents.

2. A vibrator as claimed in claim 1, in 60 which journals supporting the oscillator are connected by the addition of one or more axially-disposed tie-rods, whereby to increase the bending resistance of the oscillator. 65

3. A vibrator as claimed in claim 2, in which the body housing the oscillator is in the form of a cylinder and the diameters of the journals at their ends which face the cylinder are enlarged to correspond to the 70 inside diameter of the cylinder, said cylinder extending somewhat beyond the ends of said oscillator so as to receive the enlarged journal ends.

4. A vibrator as claimed in claim 2 or 75 3 in which the tie-rods extend through the oscillator.

5. A vibrator constructed and arranged substantially as herein described with reference to and as illustrated in the accompany- 80 ing drawings.

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COMPLETE SPECIFICATION

1 SHEET

This drawing is a reproduction of the Original on a reduced scale.

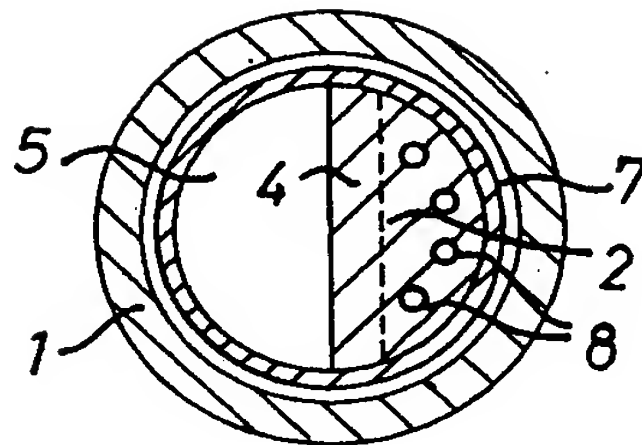


FIG. 2.

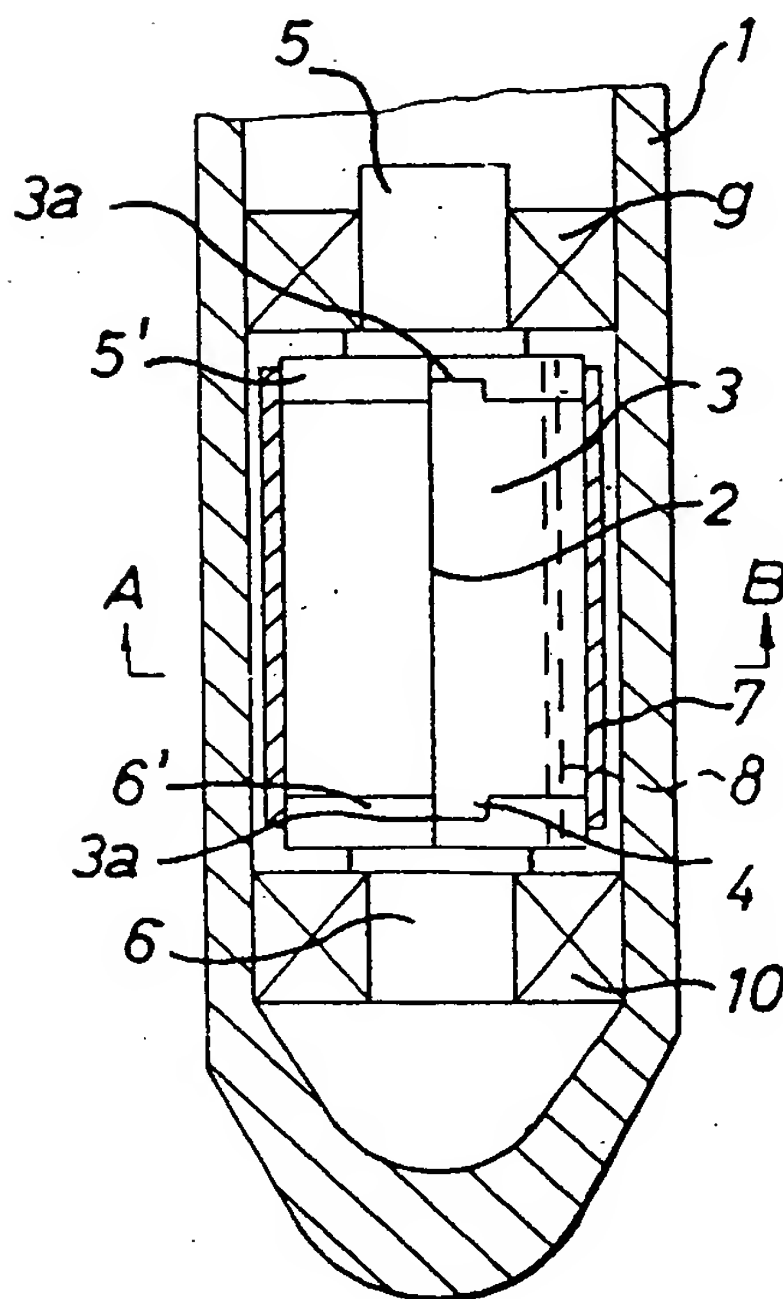


FIG. 1.